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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/705,914 | 11/13/2003 | Gee-Sung Chae | 8733.894.00-US | 7320 |
| 30827 | 7590 | 06/26/2008 | | |
| MCKENNA LONG & ALDRIDGE LLP | | | EXAMINER | |
| 1900 K STREET, NW | | | NGUYEN, LAUREN | |
| WASHINGTON, DC 20006 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/705,914

Applicant(s)

CHAE ET AL.

Examiner

LAUREN NGUYEN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 17-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 05/06/2008

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/05/2008 has been entered.

Response to Amendment

2. Applicant's arguments filed on 06/05/2008 have been fully considered but they are not persuasive.

3. The applicant argues (see page 7) regarding the amended **claim 9** that Sakata and Ishikura fails to teach or suggest the claimed combination. This is not persuasive. The examiner merely relies on **Ishikura et al.** for the teaching of forming a copper compound layer (11; see at least column 3, lines 55-63) directly on a substrate; forming a copper layer (12; see at least column 3, lines 62-67) directly on the copper compound layer; and the copper layer (12) is thicker than the copper compound layer (11, figure 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the signal line of **Sakata et al.** with the teachings of **Ishikura et al.** because such modification would provide a signal line capable of improving adhesive properties between metal electrodes and a substrate and capable of providing a stable electrical conduction of the metal electrodes (see at least columns 1 and 2, lines 64-68 and 1-5, respectively).

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 05/06/2008 was filed after the mailing date of the instant application on 11/13/2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 9-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sakata et al. (US 6,252,247)** in view of **Ishikura et al. (US 6,219,125)**.

7. With respect to **claim 9**, **Sakata et al.** (figures 1-3) discloses a manufacturing method of an array substrate for a liquid crystal display device, comprising: forming a first layer directly on a substrate (2); forming a second layer (3) directly on the first layer; forming a signal line by etching the first and second layers (see at least column 5, lines 11-16), wherein a top surface of the second layer (3) has a narrower width than a top surface of the first layer (2); forming a thin film transistor (1) having the signal line; and forming a pixel electrode (12) connected to the thin film transistor.

Sakata et al. discloses the limitations as shown in the rejection of **claim 9** above. However, **Sakata et al.** fails to teach the first and second layers being copper compound and copper layers and the copper layer is thicker than the copper compound layer. **Ishikura et al.**

(figures 4 and 7A-9E) teaches forming a copper compound layer (11; see at least column 3, lines 55-63) directly on a substrate; forming a copper layer (12; see at least column 3, lines 62-67) directly on the copper compound layer; and the copper layer (12) is thicker than the copper compound layer (11, figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the signal line of **Sakata et al.** with the teachings of **Ishikura et al.** because such modification would provide a signal line capable of improving adhesive properties between metal electrodes and a substrate and capable of providing a stable electrical conduction of the metal electrodes (see at least columns 1 and 2, lines 64-68 and 1-5, respectively).

8. With respect to **claim 10, Ishikura et al.** (figures 4 and 7A-9E) discloses the copper compound layer (11) is formed in a processing chamber where a gas flows that chemically combines with the copper (see at least column 8, lines 10-15).

9. With respect to **claim 11, Ishikura et al.** (figures 4 and 7A-9E) discloses the gas is N.sub.2 (see at least column 8, lines 10-15).

10. With respect to **claim 12, Sakata et al. (figures 1-3)** discloses the signal line includes a gate line or a data line (2 and 3).

11. With respect to **claim 13, Ishikura et al.** (figures 4 and 7A-9E) discloses the copper layer (12) is formed in a processing chamber where a gas flows that does not chemically combine with the copper (see at least column 8, lines 16-20).

12. With respect to **claim 14, Ishikura et al.** (figures 4 and 7A-9E) discloses the gas is Ar (see at least column 8, lines 16-20).

13. With respect to **claim 15, Ishikura et al.** (figures 4 and 7A-9E) discloses forming a gate electrode by etching the copper compound layer and the copper layer (see at least column 6, lines 46-50).

14. With respect to **claim 16, Sakata et al. (figures 1-3)** discloses forming the thin film transistor (21) includes: forming an active layer; forming an ohmic contact layer (5-6); forming a first layer (7) on the ohmic contact layer; forming a second layer (8) on the first layer on the ohmic contact layer; and forming a drain electrode and a source electrode by etching the first and second layers (figure 2a; see at least column 5, lines 11-16). **Sakata et al.** fails to teach the first and second layers being copper compound and copper layers. **Ishikura et al.** (figures 4 and 7A-9E) teaches forming a copper compound layer (11) and forming a copper layer (12) on the copper compound layer (see at least column 6, lines 46-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the signal line of **Sakata et al.** with the technique of **Ishikura et al.** because such modification would provide a signal line capable of improving adhesive properties between metal electrodes and a substrate and capable of providing a stable electrical conduction of the metal electrodes (see at least columns 1 and 2, lines 64-68 and 1-5, respectively).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lauren Nguyen whose telephone number is (571) 270-1428. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. N./

Examiner, Art Unit 2871

/Andrew Schechter/

Primary Examiner, Art Unit 2871